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Thermal analysis of clathrates of tripeptide LLL with organic compounds and water

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Abstract

© 2014 Akadémiai Kiadó, Budapest, Hungary. Clathrates of l-leucyl-l-leucyl-l-leucine tripeptide (LLL) formed in a solid host/guest vapor system have been studied using X-ray powder diffraction and by simultaneous thermogravimetry and differential scanning calorimetry, combined with mass-spectrometric detection of the evolved vapors. A decrease in the thermal stability of the clathrates was observed as the molecular size of bound organic guests increased. Powdered LLL clathrates with pyridine, and unusually benzene, were found to have a higher thermal stability than expected. However, thin films of the tripeptide clathrate LLL with pyridine were less stable at room temperature. These results can be used to predict the thermal stability of clathrates of short-chain oligopeptides with organic compounds.

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Keywords

Mass spectrometry, Oligopeptide, Structure-properties relationships, Thermal stability, Thermogravimetry, X-ray powder diffraction